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direct impact of the waves. There are several sorts of forces thus brought to bear upon the sea palm. The waves may strike the plant at right angles to the long axis, they may tend to crush the plant to the surface of the rock by their great weight, or they may exert a pulling force. And the plant has become a sort of living resultant of these forces.

To compare the two kelps with regard to the mechanical strength, I applied to the sea palm the same sort of blow that had been previously given to the bladder kelp. The result was what one would expect; it did not have the slightest effect. In addition, I found it quite impossible to wrench the kelps from their station, however hard I might try.

Briefly, it would appear then that the differences of the sea palm and the bladder kelp in habitat, more especially the difference in their exposure to the waves, go far to explain the differences which the plants themselves exhibit as regards mechanical strength, and, further, these plants appear to be able to withstand those stresses best which also occur among the conditions of their environment.

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## THE NORTH AMERICAN TWINFLOWERS

By P. A. RYDBERG

In all our manuals of botany, *Linnaea* is given as a monotypic genus, consisting of only *L. borealis* L. One variety has, however, been recognized by some botanists, viz., *L. borealis* var. *longiflora* Torr., described from the collection made on the Wilkes Expedition. This is found in the extreme eastern portion of Asia as well as on the American Pacific Coast from Alaska to California, and extends also into the Rocky Mountain region in British Columbia and Idaho. In connection with my work on the flora of the Rockies, I happened some time ago to look up the record of this plant. As a rule, it is easily distinguished from the common twinflower of the East and of the Rockies by its much longer leaves, especially on the flowering branches. In depau-

perate specimens this character is, however, not sufficient. I therefore looked for some differences in the flower.

In the original description and also in Gray's Synoptical Flora, the variety *longiflora* is said to have a longer corolla attenuate below into a distinct tube. I made a comparison with the eastern form and found that the flower of the Pacific Coast plant had a slightly longer corolla, but that our common twinflower had just as much a distinct tube as the other, but I found another character, viz., that the var. *longiflora* had about twice as long calyx-lobes. This character held in all American specimens. How in the European and west Asiatic? In them, the calyx-lobes were just between the two in length. But now I happened to make the most interesting discovery of all, viz., that all the latter specimens had a campanulate corolla without any indication of a narrow tube at the base. I then looked up illustrations of the European twinflower and found that the corolla there is figured as more campanulate, or short-funnelform without a distinct tube, while our American plant has rather a funnelform corolla with a short narrowed tube-like portion at the base, in fully developed flowers usually exceeding the short calyx-lobes. When the var. *longiflora* was described, it was evidently compared with the European species in which case the character of the corolla given above is the most prominent.

Being satisfied that our American twinflower really is distinct from the European, I tried to find if it had ever received a distinct name. I found that it had been named, in 1833, by Forbes in Hortus Woburnensis, page 135. His description is scarcely a description at all, for it does not distinguish the plant from *L. borealis*, the only character being orbicular shining leaves in contrast to oval. Undoubtedly his cultivated specimens had unusually broad leaves. There is, however, no doubt regarding the identity of Forbes's plant and our North American twinflower, which, therefore, should be known as *Linnaea Americana* Forbes.

The genus *Linnaea* contains consequently at least three species, viz :

*Linnaea borealis* L., of Europe and west Asia.

*Linnaea Americana* Forbes, of boreal America, extending south to New Jersey and Colorado.

*Linnaea longiflora* (Torr.) Howell (*L. borealis* var. *longiflora* Torr.), of western America and eastern Asia.

There seems to be still a fourth undescribed species, judging from rather fragmentary specimens from Kamchatka and neighboring islands. These have very small flowers and leaves, scarcely larger than those of the common cranberry.

### SHORTER NOTES

A KENTUCKY CORNEL.—Several months since, Miss Sadie F. Price sent me flowering specimens of a *Cornus*, which she had found growing on river banks near Bowling Green. Later, at my request, she furnished me with fruiting specimens from the same locality. This material is, apparently, not referable to any species thus far described, and may hereafter be known as :

**Cornus Priceae.**—A branching shrub 1–2.5 m. tall, with red and finely pubescent twigs. Leaves numerous ; blades elliptic to ovate-elliptic or ovate, 5–12 cm. long, rather leathery, usually acuminate, deep green and roughish-pubescent above, pale and more copiously, but rather softly pubescent and prominently veined beneath ; petioles 1–2 cm. long, pubescent like the twigs : corymbs 2–3 cm. broad during anthesis, 4–6 cm. broad at maturity : peduncles and pedicels closely and harshly pubescent : sepals triangular : corolla white, about 7 mm. broad : petals 4, oblong-lanceolate to linear-lanceolate : filaments slightly shorter than the petals : drupes about 3 mm. in diameter, subglobose, white ; stone about 2 mm. in diameter, scarcely longer than broad, faintly pitted.

On bluffs of the Barren River, near Bowling Green, Kentucky. The species flowers late in the spring and matures its fruit about the middle of the summer. The fruiting specimens I have were collected on July 27th. The specimens on which the species is founded are preserved in the herbarium of the New York Botanical Garden.

*Cornus Priceae* is related to *Cornus asperifolia* and *C. microcarpa*. Its leaves somewhat resemble those of the former spe-